

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 02 MAR 2006

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Applicant's or agent's file reference 15585PCT00		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/DK2004/000763		International filing date (day/month/year) 04.11.2004	Priority date (day/month/year) 04.11.2003	
International Patent Classification (IPC) or national classification and IPC B60C29/06				
Applicant OPFINDERFABRIKKEN APS et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  22.07.2005		Date of completion of this report  03.03.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer  Blandin, B  Telephone No. +31 70 340-3858 		

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/DK2004/000763

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-10 as originally filed

**Claims, Numbers**

1-20 received on 25.07.2005 with letter of 22.07.2005

**Drawings, Sheets**

1/7-7/7 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/DK2004/000763

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-20
	No: Claims	
Inventive step (IS)	Yes: Claims	1-20
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-20
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

Reference is made to the following documents :

D1: US-A-5 365 967 (MOORE ET AL) 22 November 1994 (1994-11-22)

D2: US-A-6 125 694 (BLEDSOE ET AL) 3 October 2000 (2000-10-03)

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

A pressure relief device for an inflatable tire, comprising:

- a body (14) having a chamber (32) therein and defining a circumferential outer surface portion;
  - an inflation valve (34, 36, 58, 60) arranged in the body;
  - an overpressure valve (104, 106, 108) arranged in the body for releasing air when the air pressure in the chamber exceeds a first predetermined pressure level ;
- wherein the overpressure valve comprises:
- at least one air conduit (104) extending from said chamber through the body to said circumferential outer surface portion;
  - a ring-shaped resilient member (106) which is contractively fitted around the circumferential outer surface portion, so as to keep the air conduit in a normally closed state; the properties and dimensions of the resilient member being such that it is stretched when the air pressure in the chamber exceeds the first predetermined pressure level, so as to provide an air passage from the conduit to an exterior environment.

The subject-matter of claim 1 differs from this known D1 in that a bottom portion of the body defines a cavity for receiving a valve of the tire centrally within the body, the cavity defining a threaded portion for screwing the device onto a threaded portion of a tire valve. The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as how to use the safety tire device on other tires.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons :  
**the man skilled in the art has no reason to consider the first embodiment (figs 1-3) of document D2 which presents an overpressure indicator that can be fitted to an existing tire valve.** The man skilled in the art has no indication that he could adapt the existing safety tire valve to an assembly as disclosed in document D2 (figs 1-3) which will require modifications of the body and of the valve itself.

Claims 2-20 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

New claims of 22 July 2005 - fair version

Application no.: PCT/DK2004/000763

Our ref.: 15585PCT00

Applicant: Opfinderfabrikken ApS

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## CLAIMS

1. A pressure relief device for an inflatable tire, comprising:

- a body having a chamber therein and defining a circumferential outer surface portion;

- an inflation valve arranged in the body;

10 - an overpressure valve arranged in the body for releasing air when the air pressure in the chamber exceeds a first predetermined pressure level, said overpressure valve comprising:

- at least one air conduit extending from said chamber through the body to said circumferential outer surface portion;

15 - a ring-shaped resilient member which is contractively fitted around the circumferential outer surface portion, so as to keep the air conduit in a normally closed state; the properties and dimensions of the resilient member being such that it is stretched when the air pressure in the chamber exceeds the first predetermined pressure level, so as to provide an air passage from the conduit to an exterior environment

20 characterised in that a bottom portion of the body defines a cavity for receiving a valve of the tire centrally within the body, the cavity defining a threaded portion for screwing the device onto a threaded portion of a tire valve.

2. A device according to claim 1, wherein the resilient member is arranged in a reduced diameter section of the outer surface portion.

25 3. A device according to claim 1 or 2, wherein the overpressure valve further comprises a spring element arranged in the housing, the spring element exerting a closing force on a closure element, so that the closure element opens at a second predetermined pressure level.

30 4. A device according to any of the preceding claims, wherein the body comprises a weakened section, the properties of which are such that it breaks at a pressure which is higher than at least one of said first and second predetermined pressure level.

5. A device according to any of the preceding claims, further comprising a pin for releasing a stem of a tire valve, the pin being arranged to be able to slide axially in a first passageway in

the body between a first position in which it cannot release the stem of the tire and a second position, in which it can release the stem, the body further defining a bypass passageway through which air may pass during inflation of the tire.

- 5 6. A device according to any of claims 1-4, further comprising a pin for releasing a stem of a tire valve, the pin being arranged to be able to slide axially in a first passageway in the body between a first position in which it cannot release the stem of the tire and a second position, in which it can release the stem, the pin having a head portion at that end of the device which is remote from the tire when the device is mounted to the tire, the head portion being arranged such that it abuts an inner collar portion of the body when the pin is in its first position.
- 10 7. A device according to any of the preceding claims, wherein a bottom portion of the body defines a cavity for receiving a valve of the tire centrally within the body, and wherein a top portion of the body is adapted to be connected to an inflation device, the air conduit being arranged radially displaced with respect to said cavity near the bottom portion.
- 15 8. A device according to any of the preceding claims, further comprising a protective cover for covering at least the top portion of the body, the cover being releasably connected to the cover.
9. A device according to any of the preceding claims, further comprising a pressure adjusting system for varying at least one of the first and the second predetermined pressure level.
- 20 10. A device according to claim 9, wherein the pressure adjusting system comprises means for varying a cross-sectional area of the air conduit.
11. A device according to claim 9 or 10, wherein the pressure adjusting system comprises means for varying a distortion of the resilient member.
- 25 12. A device according to any of the preceding claims, further comprising means for emitting an acoustic signal when the air pressure in the chamber exceeds at least one of the first and second predetermined pressure level.
13. A device according to any of the preceding claims, further comprising means for emitting an optical signal when the air pressure in the chamber exceeds at least one of the first and second predetermined pressure level.

14. A kit comprising a plurality of pressure relief devices according to any of the preceding claims, wherein the devices define different predetermined first and/or second pressure levels.
- 5 15. A kit according to claim 14, wherein each resilient member defines a coloured outer surface portion, and wherein the outer surface portions of the respective resilient members of the devices are coloured differently, the kit further comprising a list of colours and corresponding pressure levels.
16. A combination of a pressure relief device according to any of claims 1-12 and an inflatable tire.
- 10 17. A valve for inflation of a tire, the valve being integrated with a pressure relief device according to any of claims 1-12, so that the valve and the pressure relief device form one integrated unit.
18. A rim for an inflatable tire, the rim comprising a pressure relief device according to any of claims 1-12.
- 15 19. A rim according to claim 18, further comprising a valve for inflation of the tire, the valve being integrated with the pressure relief device, so that the valve and the pressure relief device form one integrated unit.
20. A wheel comprising a rim according to claim 18 or 19 and an inflatable tire.